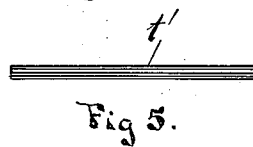
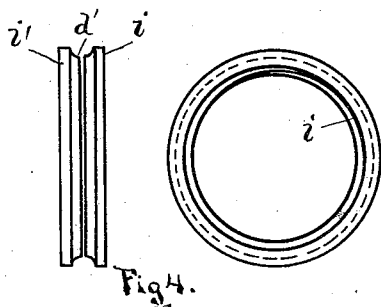
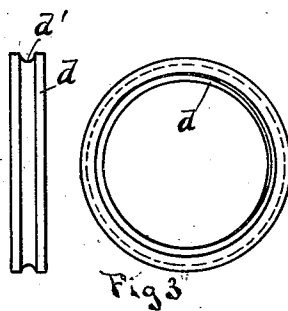
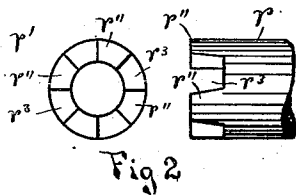
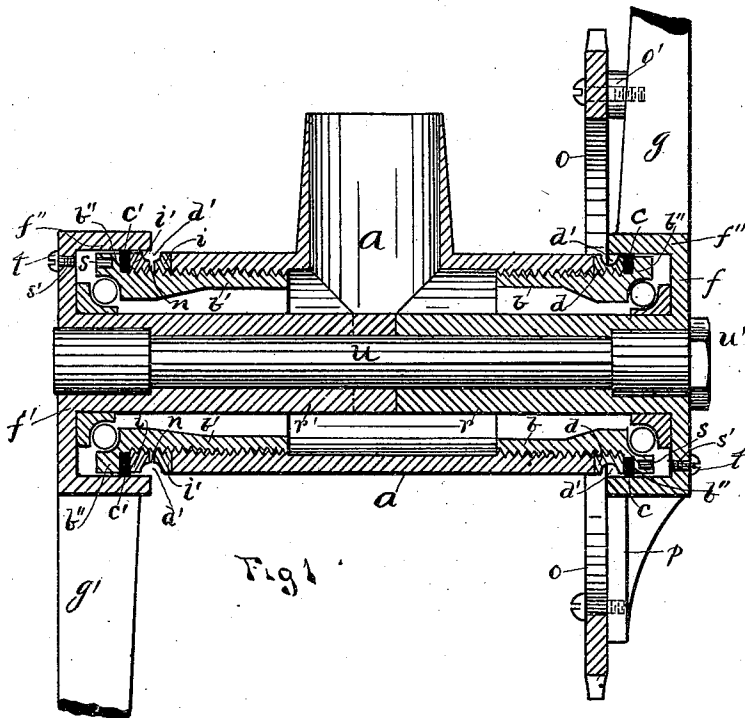


(No Model.)

G. S. GUNDERSEN.
BICYCLE BEARING.

No. 549,313.

Patented Nov. 5, 1895.



Witnesses
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By his Attorney
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UNITED STATES PATENT OFFICE.

GILBERT S. GUNDERSEN, OF MIDDLETOWN, OHIO.

BICYCLE-BEARING.

SPECIFICATION forming part of Letters Patent No. 549,313, dated November 5, 1895.

Application filed August 14, 1895. Serial No. 559,205. (No model.)

To all whom it may concern:

Be it known that I, GILBERT S. GUNDERSEN, of Middletown, county of Butler, State of Ohio, have invented a new and useful Improvement in Bicycle-Bearings; and I do declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to the letters of reference marked thereon, which form a part of this specification.

This invention relates to new and useful improvements in bicycle-bearings, with specific reference to the bearings for the crank-shaft.

The objects of the invention are to provide efficient means for preventing the entry of dust or sand to the bearings, and to provide means for adjusting the driving - cranks whereby they may be maintained in a central alignment with the frame.

To these ends the invention consists of parts and construction as will hereinafter appear.

In the accompanying drawings, which form a supplemental part of the specification, Figure 1 is a horizontal longitudinal section through the bearings. Fig. 2 represents detailed detached end view and side elevation of the divided crank-shaft. Fig. 3 represents detailed detached views of the one-part grooved lock-nut. Fig. 4 represents similar views of the two-part lock-nut. Fig. 5 is a detached detail view of the pin for locking the cranks and inner cone-bearings.

In the detailed description similar letters of reference indicate corresponding parts.

a designates a tubular forging comprising the hub or shaft casing, the interior ends of which are provided with screw-threads for engagement with the inner cone-bearings *b* and *b'*. *c* and *c'* designate felt washers that inclose the outer ends of said inner cone-bearings, and which abut with the annular shoulders *b''*.

d designates a lock-nut provided with a peripheral sand or dust groove *d'*. This nut *d* engages with the bearing *b* and occupies a position between the outer end of the forging *a* and the felt washer *c*. The latter is therefore maintained in position by said lock-nut

d and bearing *b*. The dust-caps *f* and *f'*, which are integral parts with the cranks *g* and *g'*, have each the usual laterally-projecting sand band or flange *f''*. These flanges when in position on their respective ends of the bearing should project approximately about half-way over the sand grooves in order that the sand may be deflected thereby into said grooves. The sand thus delivered to these grooves readily finds its way therearound and drops by gravity therefrom.

The locking adjustment of the bearings is mainly done on the left side. The lock-nut on that side is constructed in two parts *i* and *i'*, in order to enable a quick adjustment while the rider is on the road. The part *i* is designed to lock the inner cone-bearing *b'* and part *i'* is intended to lock the felt-washer *c'*. When the parts are in an operative position, as appears in Fig. 1, there is a space *n* between the said parts *i* and *i'*, which permits of the part *i* being turned away from the end of the forging *a*, in order that the bearing *b'* may be adjusted. This adjustment is effected as follows: In the outer end of each of the bearings *b* and *b'* there is an opening *s*. On a line with this opening there are similar openings *s'* in the caps *f* and *f'*, which are normally closed by screws *t*. When it becomes necessary to adjust the bearings, these screws are detached and a pin or pins *t'* (see Fig. 5) inserted in the openings *s* and *s'*. This locks the inner bearings *b* or *b'* and their respective caps *f* or *f'* together. The cranks *g* or *g'* are then turned to screw said bearing inwardly or outwardly, as the case may be. Before this is done, however, the nut *i* is screwed away from the forging. After the adjustment is made said nut is replaced. The crank-shaft is divided, and consists of two members *r* and *r'*, adapted to interlock at their inner ends by means of tapering jaws *r''*. *u* designates a bolt that penetrates the longitudinal center of said two-part shaft, and which is tightened by means of a nut *u'* to rigidly and permanently connect the two members. As is shown in Fig. 2, the members *r* and *r'* are each provided with four jaws *r'''* and a corresponding number of recesses *r³* for the reception of said jaws. This connection of the two parts firmly locks them, so that any unnecessary or lost motion is avoided.

The sprocket-wheel *o* has an attachment with the crank *g* by means of a boss *o'*, that projects from said crank, and to which said wheel is screwed. Said sprocket-wheel is further attached to integral arms or webs *p*, that project from the cap *f*. The wheel is attached to these arms by screws similar to the attachment to the crank *g*. There are preferably two of these arms *p*, which together with the crank *g* radiate from the cap *f* at equal distances apart. The advantage of mounting the sprocket-wheel in this manner lies in the facility that is afforded for attaching sprocket-wheels of different diameters in order to increase or decrease the speed of the wheel.

Having fully described my invention, I claim as new and desire to secure by Letters Patent—

1. In a bicycle, the combination with a tubular casing a crank shaft inclosed therein, and a dust cap inclosing an end of said casing and shaft, of an inner cone bearing —*b'*— provided with an annular shoulder —*b''*—, a felt washer held against said shoulder, a two part lock nut one part of which holds said felt washer and the other part of which holds the inner cone bearing to the casing, an an-

nular sand groove formed by said two part lock nut and adapted to conduct the sand away from the bearing, said sand groove being partially inclosed by the dust cap, substantially as shown and described. 30

2. In a bicycle, the combination with a tubular casing, a two part crank shaft inclosed in said casing, of a dust proof cap provided with arms —*p*— said cap and arms being integral parts of one of the crank shafts, and a sprocket wheel detachably secured to said arms, and to the crank shaft, of inner cone bearings —*b*— and —*b'*— provided with annular shoulders —*b''*— said inner bearings and cap having openings —*s*— and —*s'*— for adjustment, felt washers abutting with said shoulders —*b''*—, lock nuts, one of which consists of two members; said lock nuts being adapted to lock said felt washers in contact with said shoulders, and to lock said inner bearings in engagement with the tubular casing, substantially as described. 40 45 50

In testimony whereof I have hereunto set my hand this 5th day of August, 1895.

GILBERT S. GUNDERSEN.

Witnesses:

WM. B. IDDINGS,
R. J. McCARTY.